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For: A METHOD OF DETERMINING THE DEGREE OF A TYPOLOGICAL CHARACTERISTIC OF THE BODY

DECLARATION

I, Andrew Scott Marland, of 11, rue de Florence, 75008 Paris, France, declare that I am well acquainted with the English and French languages and that the attached translation of French patent application number **00/16771** as originally filed on December 21, 2000 is a true and faithful translation of that document.

All statements made herein are to my own knowledge true, and all statements made on information and belief are believed to be true; and further, these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any document or any registration resulting therefrom.

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A METHOD OF DETERMINING THE DEGREE OF A TYPOLOGICAL CHARACTERISTIC OF THE BODY

The present invention relates to evaluating typological characteristics of the body, in particular for the purpose of establishing a diagnosis.

Certain sites that are accessible on the Internet recommend cosmetic or care products to Internet users on the basis of replies given by such users to questionnaires.

Thus, certain sites recommend products as a function of a server's age and on the reply given to a question relating to skin type, namely dry, normal, mixed, or greasy, for example.

Other sites also ask for hair color, and assist the user in making a selection by displaying a color chart.

Other sites ask the user to state whether the user has very few, a few, or many wrinkles.

Apart from the hair color characteristic which can be evaluated with some degree of precision using the displayed color chart, the questionnaires available on the various sites have questions that are usually rather vague, which makes it difficult for a user to choose between several possible answers.

This leads to a high degree of imprecision in the evaluation of the typological characteristics of the body of users.

The term "typological characteristic of the body" is used in the present application to mean mechanical, morphological, or physiological characteristics and also color characteristics such as complexion or hair color.

British application GB 2 288 511 discloses a method enabling a remote diagnosis to be established which consists in sending an image of a zone for diagnosis to a remote center where an expert can establish a diagnosis.

Such a method requires the services of an expert, is not suitable for self-evaluation, and the quality of the diagnosis depends particularly on the quality of the

image sent to the expert, and thus on how well the picture was taken, thus making it relatively difficult to implement and not very reliable.

So far as the Applicant company is aware, in order to evaluate typological characteristics of the body precisely, in particular slackening of the neck, firmness of the skin, cellulite, drooping eyelids, or wrinkles, people must visit an examination center where a professional such as a beautician examines them and performs the desired evaluation.

That method gives rise to travel costs, reception costs, and to remuneration of people who have had to travel.

Furthermore, the people who are examined are not always very representative of the population as a whole, since they are for the most part people who live close to an examination center, and that can constitute a geographical barrier which impedes objective evaluation.

In order to evaluate the state of the hair, for example, it is known that a lock can be cut off and sent to a diagnosis center where an expert can examine it.

That method is not very practical and diagnosis takes a relatively long time to establish, given the time spent in the post.

There exists a need to evaluate a typological characteristic of the body precisely while reducing the cost of such evaluation.

There also exists a need to establishes a diagnosis quickly, without assistance from a professional, and remotely if so desired.

There also exists a need to enable a databank of body typologies to be built up easily and quickly.

Finally, there exists a need to reveal early signs of improvement following cosmetic treatment, so as to encourage the person to persevere with the treatment, and where appropriate for the purpose of determining the effectiveness of a cosmetic or a care product.

The invention seeks to satisfy these needs in full or in part.

The invention achieves this by a novel method enabling the actual and/or desired degree of a typological characteristic of the body of an individual to be determined, the method being characterized by the fact that it comprises the following steps:

a) generating a sequence of images expressing said characteristic to a degree that varies progressively; and

b) identifying within the sequence at least one image or run of images that corresponds to the actual and/or desired degree of said characteristic.

In the meaning of the present invention, the term "images" means any displayed or projected image, in 2D or in 3D, or any non-displayed image, corresponding to digital data stored in a memory or on a digital data recording medium, such as a hard disk or a CD-ROM.

In the meaning of the present invention, the term "sequence" means a series of images which, when observed, are not all observed simultaneously.

In particular, when the images are being observed, they are preferably displayed image by image.

The images of the sequence correspond to different degrees of the typological characteristics of the body, with said degrees preferably varying continuously or substantially continuously, i.e. an observer observing two successive images in the sequence cannot see any significant difference between them.

Each image can correspond to a representation of a region of the body, with or without makeup, with or without treatment, or to the state of a test device, for example an adhesive tape known under the trade name D'SQUAM®.

The typological characteristic of the body constituting the subject matter of the sequence of images can be selected from amongst the following:

· characteristics relating to aging such as number and depth of wrinkles, slackening of the skin, in particular of the neck, number and depth of creases, particularly of the neck, skin creasing, depth of rings around the eyes, quantity of cellulite, drooping eyelids;

· physiological or morphological characteristics such as number and size of skin flakes, quantity of sebum secretion, quantity of sweat secretion, dryness of the skin or the lips, length, curving, or density of the eyelashes or of the hair, irrigation of the skin by blood, lack of pigmentation, density of blackheads, spots of acne, blotchiness, moles, outline of the lips; and

· color of the skin or the hair, this list not being limiting.

By means of the invention, it is possible in particular to determine precisely the degree of a typological characteristic of the body which is to be evaluated for a particular person, given that this characteristic varies progressively, and preferably continuously or substantially continuously from one image to the next within the sequence of images.

The sequence of images can easily be generated on a personal computer by means of a server or on advice-giving apparatus present on sales premises, for example, thus making it possible in particular for a person to perform self-evaluation without the presence of a professional being necessary.

Evaluation can also be independent of picture-taking conditions since, in one aspect of the invention, it can be implemented without taking a picture of the person to be evaluated.

As mentioned above, the method of the invention is advantageously implemented so as to enable people to perform self-evaluation without help from a person specially trained for this purpose.

The method can also be implemented so as to enable a person to determine a desired degree for a typological

characteristic of the body, said degree being for use, for example, as a target to be reached at the end of treatment.

The method can also be implemented to reveal improvement during treatment or to measure the effectiveness of a product.

The method of the invention also makes it possible to evaluate typological characteristics of the body practically without limit on the number of persons who can be consulted.

The invention makes it possible in particular to set up a large databank easily and quickly from a group comprising more than 90 people, for example, or indeed considerably more, for example more than 1,000 people.

Evaluation can be performed remotely, actually in the homes of the people to be evaluated.

This eliminates any geographical barriers.

Since evaluation can take place in each person's home, it is possible to evaluate people who would not otherwise have been available to go to an examination center, in particular people with high purchasing power who would not be motivated in the slightest by the kind of remuneration that is paid to people who attend examination centers for evaluation purposes.

In an aspect of the invention, the images of the sequence of images are displayed on a screen and they are presented to a person to enable that person to select an image, and information is generated representative of the selected image, in particular remotely over the Internet, for example.

Such information representative of the selected image can comprise a number, for example, the number being in the form of a score, e.g. proportional to the number of images between the selected image and one of the images corresponding to an extreme degree for the typological characteristic of the body in question.

In an aspect of the invention, the method can thus comprise the step consisting in displaying images of a sequence of images in one geographical location and then in transferring by means of one or more communications protocols, and in particular Internet protocol, information representative of a selection made amongst the images of the sequence to a second geographical location where said information is collected and/or processed, in particular for the purpose of establishing a diagnosis or for building up a databank.

The images of the sequence of images can be displayed so as to create an animated sequence, which has the particular advantage of being fun to play with.

The images of the sequence of images can also be displayed as a function of action performed by the observer on at least one cursor on a scroll bar, for example.

In a particular implementation, one image is displayed at a time and the observer can modify two typological characteristics of the body as expressed on the image by acting on two cursors of two scroll bars, with the two characteristics in question being constituted by number of wrinkles and depth of wrinkles, for example.

In another aspect of the invention, the sequence of images is generated so as to enable a computer system to perform evaluation automatically, the system comprising, for example, one or more neural networks, and by a process of comparing the images of the sequence of images with an image of the person to be evaluated, the actual degree of the corresponding typological characteristic of the body of said person is determined.

Under such circumstances, the images of the sequence of images need not necessarily be displayed on a screen, it can suffice merely to compare data in computer memory zones, for example.

The sequence of images is preferably generated by computation, e.g. using morphing software, operating on at least one starting image and at least one end image corresponding respectively to different degrees of a typological characteristic of the body, preferably extreme degrees.

When morphing software is used, an image in the sequence other than the starting image normally depends on the preceding image in the sequence, with the dependency being associated with the way the images are computed, for example.

Other software can be used for generating the sequence of images, in particular graphics software for retouching images.

The sequence of images can also be generated from a film, in which the images relate for example to a single subject wearing different makeup from one picture to the next, or who has received a product that produces an effect that varies over time on the typological characteristic in question of the body, for example a product for tensioning the skin when there are wrinkles.

In an aspect of the invention, the sequence of images is generated as a function of information about the person who is to be evaluated, for example numbers of wrinkles, skin type, age, sex, eye color, ...

Thus, the starting and end images from which the sequence of images is generated can be selected from at least one image bank as a function of information about the person to be evaluated.

The sequence of images can also comprise a plurality of sub-sequences connected end to end, each sub-sequence being generated from a starting image and an end image, with the starting image of a sub-sequence of order n corresponding, for example, to the end image of the sub-sequence of order n-1.

Each image of the sequence can be generated in real time, or else all of the images of the sequence can be

generated in advance and stored before the step of selecting an image or a run of images from the sequence.

The number of images in a sequence is greater than or equal to 10, for example, is preferably greater than or equal to 20, and more preferably still is greater than or equal to 50. The number of images is selected in particular as a function of the desired precision.

The invention also provides a method of cosmetic or skin care treatment for modifying at least one typological characteristic of the body of an individual, the method comprising the following steps:

a) generating a sequence of images expressing the typological characteristic of the body to a degree that varies progressively;

b) identifying within the sequence of images, an image or a run of images corresponding to the actual degree of the typological characteristic of the body of the individual; and

c) as a function of the identified image or run of images, recommending a cosmetic or skin care treatment seeking to modify the actual degree of the typological characteristic of the body.

In step b), it is also possible within the sequence to identify an image or a run of images corresponding to the degree of the typological characteristic of the body which is desired after cosmetic or skin care treatment, with the treatment recommended in step c) being selected so as to cause the typological characteristic of the body to vary from its actual degree towards the desired degree.

The result of the evaluation can be collected remotely, in particular over the Internet.

The recommendation can be accompanied by sending an order form for the recommended products, preferably likewise by means of the Internet.

The recommendation can also be accompanied by sending the recommended treatment product.

After a given period of treatment using the recommended product, it is possible to collect the result of a new evaluation of the typological characteristic of the body concerned.

Under such circumstances, and as a function of the result of the new evaluation, the recommendation can either be maintained or modified.

Given that the evaluation can be performed accurately, it is possible to reveal very quickly any improvement even if it is relatively small, thereby encouraging the person being treated to persevere with the treatment.

It is also possible to reveal that there has been no improvement and thus cause the person under treatment to change the treatment.

The recommendation can be maintained or modified as a function of the result of the new evaluation.

The invention also provides a method of evaluating, on at least one individual, the effectiveness of a cosmetic or skin care treatment, the method comprising the following steps:

a) generating a sequence of images expressing a typological characteristic of the body on which the treatment is supposed to act, the various images of the sequence corresponding to various graduations of said typological characteristic of the body;

b) identifying within the sequence of images as generated in this way an image or a run of images corresponding to the degree of said characteristic with the individual concerned, so as to evaluate said characteristic prior to treatment;

c) performing the treatment:

d) repeating steps a) and b) so as to evaluate said characteristic after treatment; and

e) comparing the before and after treatment evaluations.

The results of each evaluation can be collected remotely, in particular over the Internet.

The invention also provides a method of generating a panel of potential users for a cosmetic or skin care product, the method comprising the following steps:

a) generating a sequence of images representing a typological characteristic of the body varying in progressive manner;

b) for each individual in a group, identifying within the sequence an image or a run of images representing the actual degree of the typological characteristic of the body with that individual or the degree desired by that individual; and

c) selecting amongst the individuals of the group those whose identified images or runs of images satisfy at least one predetermined criterion.

The results obtained in step b) can be collected remotely, it being easy to submit the same sequence of images to all of the individuals in the group, in particular over the Internet.

Once the panel has been established, it is possible to send the people making up the panel an offer to purchase a product, or indeed a sample of the product, for example.

The invention also provides a method of providing assistance in formulating a cosmetic or a skin care product, the method comprising the following steps:

a) generating a sequence of images expressing a typological characteristic of the body on which the cosmetic is supposed to act, the various images of the sequence corresponding to different graduations of said typological characteristic of the body;

b) identifying within the sequence an image or a run of images corresponding to the actual degree of the typological characteristic of the body of at least one individual; and

c) formulating the cosmetic as a function of the image or run of images identified for and/or by the individual.

The results in step b) can be collected remotely, and the sequence of images can be submitted to the individual over the Internet, in particular.

Above step c) can be subdivided into the following substeps:

i) generating a panel by selecting amongst individuals who have responded, those whose identified images or runs of images correspond to at least one predetermined criterion;

ii) manufacturing the cosmetic;

iii) applying or administering the cosmetic to the individuals of the panel;

iv) repeating steps a) and b) after one or more applications or administrations of the cosmetic in order to perform a new evaluation;

v) comparing the results of the new evaluation with the results of preceding evaluations in order to determine the effectiveness of the cosmetic; and

vi) if the effectiveness of the cosmetic is found to be insufficient, modifying the formulation of the cosmetic and/or its dosage, and repeating steps iii), iv), and v) until effectiveness that is judged satisfactory is obtained.

The invention also provides a method of establishing a diagnosis, in particular for cosmetic or skin care treatment, the method being characterized by the fact that it comprises the following steps:

a) generating a sequence of images expressing a typological characteristic of the body to a degree that varies progressively;

b) identifying within the sequence an image or a run of images corresponding to the actual degree of said characteristic with an individual to be diagnosed; and

c) establishing a diagnosis as a function of the identified image or run of images.

The result of step b) can be collected remotely, in particular over the Internet.

In an aspect of the invention, the result of the diagnosis is displayed on the screen of a computer connected to a computer server, e.g. the same screen as that on which the images of the sequence were viewed, while said images were being displayed.

The invention also provides a method of manufacturing an atlas representing different graduations in at least one typological characteristic of the body, the method being characterized by the fact that it comprises the following steps:

a) selecting at least one starting image and preferably also at least one end image corresponding to respective different degrees of a typological characteristic of the body;

b) generating a sequence of intermediate images between said starting and end images, in particular by means of morphing software;

c) selecting at least one image from the images of the sequence; and

d) producing an atlas including at least one image selected in this way.

The invention thus makes it possible to produce an atlas that is very precise since the invention makes it very easy to generate as many intermediate graduations as might be desired between two degrees of a typological characteristic of the body.

The invention also provides a method of generating a multi-vector databank grouping together a set of vectors each corresponding to an individual, each vector comprising at least one component constituted by information representative of a image or a run of images from a sequence of images, each vector preferably comprising at least two components constituted by

information representative of images or runs of images selected from two sequences expressing different typological characteristics of the body.

The invention also provides apparatus for determining the actual or desired degree of a typological characteristic of the body, the apparatus being characterized by the fact that it comprises a programmed unit for generating a sequence of images expressing different graduations of a typological characteristic of the body.

Preferably, said characteristic varies continuously or substantially continuously within said sequence.

In a particular embodiment, such apparatus comprises control means such as a button on a mouse, or an action button displayed on a touch-sensitive screen, or a keyboard, or control by eye, or control by voice, enabling an image of the sequence to be selected.

Still in a particular embodiment, the apparatus comprises data input means such as a keyboard or an action button displayed on a touch-sensitive screen to select starting and end images from at least one image bank, with the sequence being generated from said images by means of morphing software the selection being performed as a function of information communicated by a user via said data input means.

The apparatus can include a generator for generating at least one scroll bar with a cursor enabling the images of the sequence to be caused to scroll on a screen, with preferably only one image of the sequence being displayed at a time.

The apparatus can also comprise a generator for generating two scroll bars with two respective associated cursors, each cursor enabling a corresponding typological characteristic of the body expressed by the displayed image to be modified on the screen, for example number of wrinkles for one of the cursors and depth of wrinkles for the other cursor.

The apparatus preferably comprises means enabling a selected degree for a typological characteristic of the body to be validated, with such validation being performed, for example, by means of a cursor, an action button, a mouse button, or a key on the keyboard, the action button optionally presenting a variety of shapes, possibly being superposed on a cursor or on a table displayed on the screen, and the screen possibly being touch-sensitive.

Advantageously, the apparatus includes an indicator suitable for providing an indication, preferably in numerical form, representative of the degree of the typological characteristic of the body expressed by the image displayed on the screen, said numerical indication being constituted, for example, by a score which is proportional to the number of images in the sequence between the displayed image and an image of the sequence corresponding to a predetermined degree for the typological characteristic of the body, for example an extreme degree.

The apparatus advantageously includes a modem enabling it to communicate with a server or a remote computer.

In a particular embodiment, the apparatus includes means enabling information representing a selected image to be sent to a server.

The apparatus can also include means such as a camera or a scanner for acquiring an image of a person or a test device for evaluation, and a computer system such as a neural network or some other artificial intelligence device for comparing said image with the images of the sequence.

Other characteristics and advantages of the present invention will appear on reading the following detailed description of non-limiting implementations and on examining the accompanying drawings, in which:

· Figures 1 and 2 are highly diagrammatic representations of a personal computer;

· Figure 3 is a diagram showing certain aspects of a program for implementing the invention;

· Figures 4 to 6 are diagrams representing a sequence of images concerning different characteristics of body typology;

· Figure 7 is a block diagram showing an example of the method of the invention;

· Figure 8 is a diagram showing self-contained apparatus for providing personalized advice concerning cosmetics or care products;

· Figure 9 is a diagram representing a server connected to a plurality of personal computers, in particular via the Internet;

· Figure 10 shows how a databank can be built up containing information relating to various typological characteristics of the body;

· Figure 11 shows how a typological characteristic of the body is determined automatically; and

· Figure 12 represents an image displayed on a screen together with two cursors associated with respective scroll bars, each cursor serving to vary a degree of a typological characteristic of the body.

Figures 1 and 2 shows a personal computer 2 comprising a central unit 4 connected to various external peripherals such as a screen 3, a printer 5, a modem 6, a keyboard 7, a mouse 10, and to internal peripherals such as readers for CD-ROMS and floppy disks 8, and a hard disk 9.

The central unit 4 is also connected to working memory (RAM) 11.

In a first implementation of the invention, a program 15 represented diagrammatically in Figure 3 is loaded into the personal computer 2.

The program 15 includes morphing software 20 adapted to generate a sequence of intermediate images (or

metamorphoses) between a starting image and an end image, contained in respective files 16 and 17.

In the example described, the program 15 causes a single image of the sequence to be displayed at a time on the screen 3.

Figure 4 is a diagram showing an example of a sequence in which the firmness of the lower part of the face and the neck varies progressively from a starting image 21 and an end image 22, passing through a series of intermediate images 23, with only a few of the intermediate images 23 being shown in Figure 4.

The invention is not limited to one particular typological characteristic of the body, and by way of example, Figure 5 shows the starting and end images 21 and 22 for a sequence of images relating to slackening of skin on the neck.

The various images of the sequence need not correspond to a representation of a portion of the human body, but can correspond to a representation of a test device, e.g. an adhesive tape, as shown in Figure 6.

This figure shows varying quantities of sebum which can be picked up by the tape.

The starting image 21 shows tape with no sebum deposited thereon, after being pressed against the skin and removed therefrom.

The end image 22 shows the tape covered over a large fraction of its area by a deposit of sebum or other impurities.

Still further sequences of images can be generated, without thereby going beyond the ambit of the present invention, relating to other characteristics of body typology.

The program 15 can also be arranged to cause a sequence of images to scroll image by image on the screen 3 while allowing an observer to stop on an image by pressing a key of the keyboard 7 or by clicking on a button of the mouse 10, and other control means are also

possible without thereby going beyond the ambit of the present invention, in particular use can be made of a touch-sensitive screen.

The images 23 can also be caused to scroll as a function of action taken by an observer on a cursor 24 of a scroll bar 25, as shown in Figures 5 and 6.

The starting and end images 21 and 22 can be selected from a bank of respective starting and end images 27 and 28, as a function of information supplied to a selection engine 29, which engine can be used, for example, to display one or more questionnaires and to process the corresponding replies.

Before the various images 23 of a sequence are generated, the user can thus inform the program 15 about certain characteristics of the user's own body typology.

For example, with crow's foot wrinkles, the program 15 can ask the user to specify the number of wrinkles present in the zone concerned by answering a questionnaire.

A starting image having the number of wrinkles specified by the user is selected from the starting image bank 27.

An end image having the same number of wrinkles is selected from the end image bank 28.

The computer then displays a crow's foot image having the number of wrinkles specified by the user.

In this example, the typological characteristic of the body is wrinkle depth, and the user can act on the cursor of the scroll bar to modify the image gradually so as to increase or decrease wrinkle depth until the display image is an exact reflection of the user's own wrinkles.

The position of the cursor on the scroll bar then gives wrinkle depth, and this position can be identified, for example, by means of alphanumeric information 26 being displayed on the screen, with this information being transmitted where appropriate to a remote server

for the purpose of drawing up a diagnosis and/or recommending a product that acts on wrinkles.

The alphanumeric information 26 can be a score proportional to the number of images 23 in the sequence between the image displayed on the screen and the starting or end image.

An individual with young skin can thus achieve the highest score, for example 10/10, whereas an old person will have the lowest score, e.g. 0/10.

The various images 23 in a sequence are generated in the examples described by means of the morphing software 20 which can be of any conventional type, e.g. computing pixel by pixel interpolations between two images, thereby enabling it to build up a continuous series of intermediate images 23 between the starting and end images 21 and 22.

Examples of morphing software that can be mentioned in particular include the programs known under the following names: WINMORPH V2.1; CINEMORPH 1.2; MPMORPH 4x; TSMORPH 32; FASTMORPHER 1.03; VISIONAIRE 1.0; MORPH PLUS 1.04; V-MORPH 2.0; AGA MORPH 2.2, IMAGE MASTER 1.50R; ELASTIC DREAMS 1.01; and FANTASTIC DREAMS.

The program 15 can also have means for loading a file corresponding to an image I of the person or the test device to be evaluated, as obtained using a scanner or a digital camera, for example.

The program 15 can also be arranged to cause the screen 3 to display simultaneously an image 23 from the sequence and the image I so as to make comparison easier.

The image I can also be used in a comparison engine 80 of the artificial intelligence type as represented diagrammatically in Figure 11, making it possible automatically to determine the degree of the typological characteristic of the body which corresponds to the person being evaluated.

The personal computer 2 can operate in self-contained manner, with the program 15 being loaded from a CD-ROM or a floppy disk, for example.

Under such circumstances, the computer 2 can enable a user to perform self-evaluation by implementing the succession of steps illustrated in Figure 7.

The first step 40 consists, for example, in the user of the personal computer 2 replying to various questionnaires enabling the program 15 to use the selection engine 29 to select a starting image 21 and an end image 22 from the banks of starting images and end images 28 and 29 respectively, for example as a function of the age and the sex of the user.

Thus, if the person seeking to perform self-evaluation is a young woman, the starting and end images 21 and 22 will be different from those which would be selected if the user is an old man.

The following step 41 consists in the morphing software 20 generating a sequence of images.

The next step 42 corresponds to selecting an image of the sequence, either by stopping on the image by pressing a key of the keyboard or by positioning the cursor appropriately on the scroll bar, for example.

The following step 43 can be a step, for example, in which the program 15 draws up a diagnosis as a function of the replies to the questionnaires and of the degree of the typological characteristic of the body as evaluated.

The last step 44 can, for example, be a step of recommending a product as a function of the diagnosis performed in the preceding step 43.

Such a product can be determined by searching through a database of cosmetics and care products for products having an action on the characteristic of body typology that has been evaluated and which are listed as being suitable for the profile of the person as previously evaluated.

The method of Figure 7 can be implemented by means of a personal computer 2 as described above, with this computer being situated in the home of the person to be evaluated, for example.

It would not go beyond the ambit of the present invention for evaluation to be performed on premises where cosmetic and care products are sold, for example as described below with reference to Figure 8.

This figure shows apparatus 50 for giving advice which comprises a touch-sensitive screen 51 connected to a central unit (not shown), lighting devices 52, and a mirror 53, with these devices all being supported by a cabinet 54.

By way of example, the cabinet 54 can stand next to shelves carrying various cosmetic or care products suitable for being recommended by the advice-giving apparatus 50 and for being identified by it.

Steps 40 to 44 in Figure 7 can be performed using the advice-giving apparatus 50.

In an aspect of the invention, the personal computer 2 or advice-giving apparatus 50 is advantageously connected to a server 1 as shown in Figure 9, e.g. by means of the Internet.

By way of example, the server 1 can download the above-described program 15 to the personal computer 2.

The user can thus download the program 15 from an Internet site, for example.

The program 15 for generating the images 23 need not be downloaded, but could be used remotely.

Under such circumstances, the personal computer 2 connected to the server 1 can act merely as a terminal.

When the evaluation program is consultable on-line, the Internet user can perform self-evaluation or can be evaluated in the presence of a person trained for this purpose merely by connecting to the site that gives access to the program, and can thus obtain a diagnosis,

and where appropriate can have a cosmetic or care product recommended.

Furthermore, a manufacturer of cosmetic or care products can make use of the kind of data that such a site collects to obtain information enabling the products it manufactures to be best adapted to the body typology of its client base.

In particular, the invention can serve to build a multi-vector databank bringing together data relating to a plurality of different typological characteristics of the body in a single person.

For example, Figure 10 represents a composite image 63 that is the result of combining three images 60, 61, and 62 selected by a person performing self-evaluation or being evaluated, and relating respectively to typological characteristics of the body such as lower face typology, middle face typology, and upper face typology, for example.

By collecting together a set of composite images 63 or of data representative of such images, it is possible to build up a databank in which each composite image 63 constitutes a kind of identikit portrait of the corresponding person.

The set of composite images 63 can be built up under identical conditions that are independent in particular of the picture-taking conditions, thus increasing the reliability of the data and facilitating comparisons.

It is thus possible to build up a multi-vector databank 64 comprising a plurality of vectors V_1, ..., V_n each having a component X_{1q}, X_{2q}, X_{3q}, where q is an integer in the range 1 to n, and n is the number of individuals who have served to build up the databank.

Each component is representative of an identified image in a sequence of images.

For example, for individual number p in the group, identified image 60 can be associated with a numerical

value X_{1p}, image 61 with a numerical value X_{2p}, and image 62 with a numerical value X_{3p}.

Each vector V_p serves to quantify the body typology of individual number p in the group in a precise manner.

It will be understood that the invention makes it possible to evaluate a typological characteristic of the body very precisely, which is advantageous for showing up the effect of a cosmetic or care product.

It suffices to perform an evaluation prior to applying or administering the product and then to perform another evaluation after the treatment, and to compare the results of the evaluations.

Given the precision made possible by the invention, an improvement is shown up very quickly, which, where appropriate, can serve to encourage the person being treated to continue with the treatment.

In analogous manner, a person can be enabled to observe very quickly, by means of the invention, that some particular treatment is not effective and should therefore be changed.

The invention also makes it possible to monitor variation in a pathological condition, for example to decide whether treatment has become necessary.

The invention is not limited to the typological characteristics of the body mentioned above, and it can be applied to a large number of typological characteristics of the body, in particular sagging of the face, dryness of the skin, or evaluating the skin state of the neck, with this list not being limiting.

The above-described server 1 can also constitute an expert system of the artificial intelligence type arranged to give a diagnosis in completely automatic manner to an Internet user who has conducted self-evaluation and has transmitted the results thereof to the server 1.

The invention is not limited to determining a single typological characteristic of the body at a time.

By way of example, Figure 12 shows an image 23 associated with two cursors 24 and 24' on scroll bars 25 and 25', the cursors 24 and 24' serving respectively to modify wrinkle depth and wrinkle number.

The numerical information 26 and 26' representing the respective degrees of the corresponding typological characteristics of the body are associated with the cursors.

By moving the cursors 24 and 24', the user can change the number of wrinkles and/or the depth of the wrinkles.

The various examples described above can be applied to self-evaluation.

Evaluation can also be performed by a beauty consultant, on a stand for selling cosmetic or care products or in a beauty shop, for example, said beauty consultant comparing the various images that appear on the screen with the person to be evaluated.

It is possible to use other morphing software to generate the images in a sequence, and even cinematographic means and/or signal processing means, e.g. for the purpose of acting on the contrast or the gray level or on certain colors of the image.

Depending on the position of a cursor, for example, it is possible to decide to display on one out of every x images in the sequence in order to cause the modification of a typological characteristic of the body to be more marked and to take place more quickly when the cursor is moved, or in order to make it easier to determine two typological characteristics of the body simultaneously.

A plurality of images representing various typological characteristics of the body can be displayed simultaneously on the screen, e.g. a lower face image and an upper face image.

Sequences can be built up from sub-sequences.

A starting image of a sub-sequence of order n can be constituted by an end image of a sub-sequence of order n-

1, the starting and/or end images of sub-sequences of order n and n-1 having at least typological characteristic of the body in common, and possibly more than one such characteristic.

Thus, in Figure 12, the starting and end images of sub-sequences of order n and n-1 relating to wrinkle depth can also be used as starting or end images for sub-sequences relating to number of wrinkles.

CLAIMS

1/ A method of determining the actual and/or desired degree of a typological characteristic of the body of an individual, the method being characterized by the fact that it comprises the following steps:

a) generating a sequence of images (21, 22, 23) expressing said characteristic to a degree that varies progressively; and

b) identifying within the sequence at least one image or run of images that corresponds to the actual and/or desired degree of said characteristic.

2/ A method according to claim 1, characterized by the fact that the images of the sequence corresponds to different degrees of the typological characteristic of the body in a progression that is continuous or substantially continuous.

3/ A method according to claim 1, characterized by the fact that the sequence of images (21, 22, 23) is generated on a personal computer (2).

4/ A method according to any one of the three preceding claims, characterized by the fact that the sequence of images (21, 22, 23) is generated by means of a server (1).

5/ A method according to claim 1, characterized by the fact that the sequence of images (21, 22, 23) is generated by advice-giving apparatus (50), in particular advice-giving apparatus (50) present on sales premises.

6/ A method according to any preceding claim, characterized by the fact that the images (21, 22, 23) of the sequence of images are displayed in such a manner as to create an animated sequence.

7/ A method according to any one of claims 1 to 5, characterized by the fact that the images (21, 22, 23) of the sequence of images are displayed as a function of an action of the observer, in particular on a cursor (24; 24') of a scroll bar (25; 25').

8/ A method according to any preceding claim, characterized by the fact that the images (21, 22, 23) of the sequence of images are displayed on the screen (3) and are presented to a person to enable that person to select an image (23), and by the fact that information is generated that is representative of the image that is selected.

9/ A method according to the preceding claim, characterized by the fact that the information representative of the selected image comprises a number (26; 26').

10/ A method according to either one of the two immediately preceding claims, characterized by the fact that the information representative of the selected image (23) is collected remotely.

11/ A method according to the preceding claim, characterized by the fact that it comprises the steps which consist in displaying images (21, 22, 23) of a sequence of images in one geographical location and then in transferring by means of one or more communications protocols, and in particular Internet protocol (IP), information representative of a selection made amongst the images (21, 22, 23) of the sequence to a second geographical location where said information is collected and/or processed, in particular for the purpose of establishing a diagnosis or for building up a databank.

12/ A method according to claim 1, characterized by the fact that the sequence of images is generated in such a manner as to enable a computer system (80) to perform evaluation automatically, and by the fact that a process of comparison between images (23) of the sequence of images and an image (I) of the person to be evaluated is used to determine the actual degree of the typological characteristic of the body that corresponds to said person.

13/ A method according to any preceding claim, characterized by the fact that the sequence of images is generated by computation, preferably means of morphing software (20) on the basis of at least one starting image (21) and at least one end image (22), corresponding to respective different degrees of a typological characteristic of the body.

14/ A method according to any preceding claim, characterized by the fact that the sequence of images is generated as a function of information relating to the person that is to be evaluated.

15/ A method according to claim 13, characterized by the fact that the starting and end images are selected from at least one image bank (27, 28) as a function of information relating to the person to be evaluated.

16/ A method according to any preceding claim, characterized by the fact that the sequence of images comprises a plurality of sub-sequences connected end to end, each sub-sequence being generated from a starting image and an end image, the starting image of a sub-sequence of order n corresponding preferably to the end image of the sub-sequence of order n-1.

17/ A method according to any preceding claim, characterized by the fact that an image (23) is displayed and an observed is enabled to modify two typological characteristics of the body expressed by said image by acting on two cursors (24; 24') of two scroll bars (25; 25').

18/ A method according to any preceding claim, characterized by the fact that the number of images in a sequence is greater than or equal to 10, preferably greater than or equal to 20, and more preferably greater than or equal to 50.

19/ A cosmetic treatment method for modifying at least one typological characteristic of the body of an individual, the method being characterized by the fact that it comprises the following steps:

a) generating a sequence of images expressing the typological characteristic of the body to a degree that varies progressively;

b) identifying within the sequence of images, an image or a run of images corresponding to the actual degree of the typological characteristic of the body of the individual; and

c) as a function of the identified image or run of images, recommending a cosmetic treatment seeking to modify the actual degree of the typological characteristic of the body.

20/ A method according to claim 19, characterized by the fact that within the sequence, an image or a run of images is/are identified corresponding to the degree of the typological characteristic of the body that is desired after cosmetic treatment, the treatment recommended in step c) being selected so as to cause the typological characteristic of the body to vary from its actual degree towards the desired degree.

21/ A method according to claim 19 or claim 20, characterized by the fact that the result of the evaluation is collected remotely, in particular by means of the Internet.

22/ A method according to claim 19 or claim 21, characterized by the fact that the recommendation is accompanied by sending an order form for the recommended product, preferably by means of the Internet.

23/ A method according to any one of claims 19 to 22, characterized by the fact that the recommendation is accompanied by sending the recommended treatment product.

24/ A method according to any one of claims 19 to 23, characterized by the fact that, after a given duration of treatment by means of the recommended product, the results of a new evaluation of the typological characteristic concerned of the body are collected.

25/ A method according to the preceding claim, characterized by the fact that the recommendation is maintained or modified as a function of the result of the new evaluation.

26/ A method seeking to evaluate the effectiveness on at least one individual of a cosmetic treatment, the method being characterized by the fact that it comprises the following steps:

a) generating a sequence of images expressing a typological characteristic of the body on which the treatment is supposed to act, the various images of the sequence corresponding to various graduations of said typological characteristic of the body;

b) identifying within the sequence of images as generated in this way an image or a run of images

corresponding to the degree of said characteristic with the individual concerned, so as to evaluate said characteristic prior to treatment;

c) performing the treatment:

d) repeating steps a) and b) so as to evaluate said characteristic after treatment; and

e) comparing the before and after treatment evaluations.

27/ A method according to the preceding claim, characterized by the fact that the results of each evaluation are collected remotely.

28/ A method of generating a panel of potential users of a cosmetic or skin care product, characterized by the fact that it comprises the following steps:

a) generating a sequence of images representing a typological characteristic of the body varying in progressive manner;

b) for each individual in a group, identifying within the sequence an image or a run of images representing the actual degree of the typological characteristic of the body with that individual or the degree desired by that individual; and

c) selecting amongst the individuals of the group those whose identified images or runs of images satisfy at least one predetermined criterion.

The results obtained in step b) can be collected remotely, it being easy to submit the same sequence of images to all of the individuals in the group, in particular over the Internet.

29/ A method of providing assistance in formulating a cosmetic, the method being characterized by the fact that it comprises the following steps:

a) generating a sequence of images expressing a typological characteristic of the body on which the

cosmetic is supposed to act, the various images of the sequence corresponding to different graduations of said typological characteristic of the body;

b) identifying within the sequence an image or a run of images corresponding to the actual degree of the typological characteristic of the body of at least one individual; and

c) formulating the cosmetic as a function of the image or run of images identified for and/or by the individual.

30/ A method according to claim 29, characterized by the fact that the results of step b) are collected remotely.

31/ A method according to claim 29 or claim 30, characterized by the fact that above step c) is subdivided into the following substeps:

i) generating a panel by selecting amongst individuals who have responded, those whose identified images or runs of images correspond to at least one predetermined criterion;

ii) manufacturing the cosmetic;

iii) applying or administering the cosmetic to the individuals of the panel;

iv) repeating steps a) and b) after one or more applications or administrations of the cosmetic in order to perform a new evaluation;

v) comparing the results of the new evaluation with the results of preceding evaluations in order to determine the effectiveness of the cosmetic; and

vi) if the effectiveness of the cosmetic is found to be insufficient, modifying the formulation of the cosmetic and/or its dosage, and repeating steps iii), iv), and v) until effectiveness that is judged satisfactory is obtained.

32/ A method of establishing a diagnosis, in particular for cosmetic or skin care treatment, the method being characterized by the fact that it comprises the following steps:

a) generating a sequence of images expressing a typological characteristic of the body to a degree that varies progressively;

b) identifying within the sequence an image or a run of images corresponding to the actual degree of said characteristic with an individual to be diagnosed; and

c) establishing a diagnosis as a function of the identified image or run of images.

33/ A method according to claim 32, characterized by the fact that the results of step b) are collected remotely.

34/ A method according to the preceding claim, characterized by the fact that the result of the diagnosis is displayed on the screen of a computer connected to a computer server.

35/ A method of producing an atlas representing different graduations of at least one typological characteristic of the body, the method being characterized by the fact that it comprises the following steps:

a) selecting at least one starting image and preferably also at least one end image corresponding to respective different degrees of a typological characteristic of the body;

b) generating a sequence of intermediate images between said starting and end images, in particular by means of morphing software;

c) selecting at least one image from the images of the sequence; and

d) producing an atlas including at least one image selected in this way.

36/ A method of generating a multi-vector databank grouping together a set of vectors each corresponding to an individual, each vector (V_1, ..., V_n) comprising at least one component (X_{1q}, X_{2q}, X_{3q}) constituted by information representative of a image or a run of images from a sequence of images identified by the method of claim 1, each vector preferably comprising at least two components constituted by information representative of images or runs of images selected from two sequences expressing different typological characteristics of the body.

37/ The use of a method according to any preceding claim with one of the following typological characteristics of the body, and excluding any therapeutic use:

· characteristics relating to aging such as number and depth of wrinkles, slackening of the skin, in particular of the neck, number and depth of creases, particularly of the neck, skin creasing, depth of rings around the eyes, quantity of cellulite, drooping eyelids;

· physiological or morphological characteristics such as number and size of skin flakes, quantity of sebum secretion, quantity of sweat secretion, dryness of the skin or the lips, length, curving, or density of the eyelashes or of the hair, lack of pigmentation, density of blackheads, spots of acne, blotchiness, moles, outline of the lips; and

· color of the skin or the hair.

38/ Apparatus (1; 2; 50) for determining the degree of a typological characteristic of the body in order to implement the method as defined in any one of claims 1 to 18, the apparatus being characterized by the fact that it comprises a programmed unit for generating a sequence of images (21, 22, 23) expressing various graduations of a typological characteristic of the body.

39/ Apparatus according to claim 38, characterized by the fact that said characteristic varies continuously or substantially continuously within said sequence.

40/ Apparatus according to claim 38 or claim 39, characterized by the fact that it includes control means such as a button on a mouse (10) or an action button displayed on a touch-sensitive screen (51) or a keyboard (7), or control by eye, or control by voice, enabling an image of the sequence to be selected.

41/ Apparatus according to claim 38 or claim 40, characterized by the fact that it includes data input means such as a keyboard (7) or an action button displayed on a touch-sensitive screen (51) to select starting and end images (21, 22) from at least one image bank (27, 28), with the sequence being generated from said images by means of morphing software (20) as a function of information communicated by a user via the data input means.

42/ Apparatus according to any one of claims 38 to 41, characterized by the fact that it includes a generator for generating at least one scroll bar (25; 25') and a cursor (24; 24') enabling the scrolling of images of the sequence on a screen (3; 50) to be controlled, with only one image of a sequence of images being displayed at a time.

43/ Apparatus according to any one of claims 38 to 42, characterized by the fact that it includes means for sending to a server information representative of a selected image.

44/ Apparatus according to any one of claims 38 to 43, characterized by the fact that it includes means enabling

information (26; 26') representative of a selected image to be sent to a server (1).

45/ Apparatus according to any one of claims 38 to 44, characterized by the fact that it includes means such as a camera or a scanner for acquiring an image (I) of a person, or of a test device for evaluation, and a computer system (80) for comparing said image (I) with the images (23) of the sequence.

46/ Apparatus according to any one of claims 38 to 45, characterized by the fact that it includes a generator for generating two scroll bars and two associated cursors, each cursor enabling a typological characteristic of the body expressed by the displayed image to be modified on the screen.

47/ Apparatus according to any one of claims 38 to 46, characterized by the fact that it includes means enabling the selection of a particular degree of the typological characteristic of the body to be validated.

48/ Apparatus according to any one of claims 38 to 47, characterized by the fact that it includes an indicator suitable for giving an indication (26; 26'), preferably in numerical form, representative of the degree of the typological characteristic of the body as expressed by the image displayed on the screen.

A B S T R A C T

A method of determining the actual and/or desired degree of a typological characteristic of the body of an individual, the method being characterized by the fact that it comprises the following steps:

a) generating a sequence of images (21, 22) expressing said characteristic to a degree that varies progressively; and

b) identifying within the sequence at least one image or run of images that corresponds to the actual and/or desired degree of said characteristic.